

CLAIMS

1. A carbon fine powder coated with a metal oxide, a metal nitride or a metal carbide, in which a thin film layer of the metal oxide, the metal nitride or the metal carbide is uniformly coated on the surface of the carbon fine powder having a large specific surface area.
2. The carbon fine powder coated with a metal oxide, a metal nitride or a metal carbide according to claim 1, wherein the thin film layer of the metal oxide, the metal nitride or the metal carbide to be coated has a thickness of from 1 nm to 1,000 nm.
3. The carbon fine powder coated with a metal oxide, a metal nitride or a metal carbide according to claim 1, wherein the metal oxide, the metal nitride or the metal carbide is one or at least two of metal oxides, metal nitrides or metal carbides selected from the groups consisting of manganese, vanadium, molybdenum, tungsten, titanium, iron, copper, silver, nickel, chromium, aluminum, tin, lead, silicon, germanium, gallium, indium, zinc, cobalt, niobium and tantalum.
4. The carbon fine powder coated with a metal oxide, a metal nitride or a metal carbide according to claim 1, wherein the specific surface area of the carbon fine powder is from 50 m²/g to 3,500 m²/g.
5. The carbon fine powder coated with a metal oxide, a metal nitride or a metal carbide according to claim 1, wherein the metal oxide, the metal nitride or the metal carbide in the thin film layer has a crystal structure of a crystalline phase, an amorphous phase or a microcrystalline phase.

6. A process for producing a carbon fine powder coated with a metal oxide, a metal nitride or a metal carbide, which comprises irradiating an ultrasonic wave on a dispersion comprising a metal oxide fine particle, a metal nitride or metal carbide, a carbon fine particle and a solvent to cause a sonochemical reaction on the surface of the carbon fine particle to thereby uniformly forming a thin film layer of the metal fine particle on the surface of the carbon fine particle.

7. The process for producing a carbon fine powder coated with a metal oxide, a metal nitride or a metal carbide according to claim 6, wherein the ultrasonic wave has a frequency of from 1 kHz to 1 MHz, and the irradiated ultrasonic wave in the solution has an energy density of from 1 mW/cm³ to 1 kW/cm³.

8. The process for producing a carbon fine powder coated with a metal oxide, a metal nitride or a metal carbide according to claim 6 or 7, wherein the solvent is one or at least two selected from the group consisting of water, alcohol, ketone, ether, ester, organic acid, amine and amino alcohol.

9. A supercapacitor which uses the carbon fine powder coated with a metal oxide, a metal nitride or a metal carbide according to any one of claims 1 to 5 as a charge-accumulating and -releasing material.

10. The supercapacitor according to claim 9, which uses an electrode in which a resin composition comprising the carbon fine powder coated with a metal oxide, a metal nitride or a metal carbide according to any one of claims 1 to 5 is molded.

11. The supercapacitor according to claim 9, which uses an electrode in which a reticulate mesh of an electrode metal is coated with a resin composition

comprising the carbon fine powder coated with a metal oxide, a metal nitride or a metal carbide and is dried.

12. The supercapacitor using the electrode according to claim 10, wherein the resin is any one of polytetrafluoroethylene (PTFE), polyethylene and polypropylene.

13. The supercapacitor using the electrode according to claim 10, wherein the resin further comprises a conductive material fine particle.

14. The supercapacitor using the electrode according to claim 10, wherein the conductive material is one or at least two of carbon, gold, silver, copper, nickel and palladium.

15. A supercapacitor which uses the electrode for a supercapacitor according to claim 10 as at least one of a cathode and an anode of the supercapacitor.

16. A supercapacitor which uses the carbon fine powder coated with a metal oxide, a metal nitride or a metal carbide according to any one of claims 1 to 5 as an interelectrode material between a cathode and an anode.

17. The supercapacitor according to claim 9, wherein an electrolyte is an aqueous electrolyte or a nonaqueous electrolyte.

18. The supercapacitor according to claim 17, which uses one or at least two selected from a proton, a lithium ion, a magnesium ion, a potassium ion, a sodium ion, a calcium ion, a barium ion, a yttrium ion, a lanthanum ion, an ammonium ion and an organoammonium ion as an electrolyte ion.

19. A high-performance secondary battery which uses the carbon fine powder coated with a metal oxide, a metal nitride or a metal carbide according to any one of claims 1 to 5 as a charge-accumulating and -releasing material.

20. A high-performance secondary battery which uses an electrode in which a resin composition comprising the carbon fine powder coated with a metal oxide, a metal nitride or a metal carbide according to any one of claims 1 to 5 is molded.

21. The high-performance secondary battery according to claim 20, which uses an electrode in which a reticulate mesh of an electrode metal is coated with a resin composition comprising a carbon fine powder coated with a metal oxide, a metal nitride or a metal carbide and is dried.

22. The high-performance secondary battery using the electrode according to claim 20, wherein the resin is any one of polytetrafluoroethylene (PTFE), polyethylene and polypropylene.

23. The high-performance secondary battery using the electrode according to claim 20, wherein the resin further comprises a conductive material fine particle.

24. The high-performance secondary battery using the electrode according to claim 23, wherein the conductive material is one or at least two of carbon, gold, silver, copper, nickel and palladium.

25. A high-performance secondary battery, which uses the electrode according to claim 19 or 20 as a cathode or an anode.

26. A high-performance secondary battery, wherein uses the carbon fine powder coated with a metal oxide, a metal nitride or a metal carbide according to any one of claims 1 to 5 as an interelectrode between a cathode and an anode.